SYSTEM FOR PROVIDING PRODUCT ENVIRONMENT INFORMATION

BACKGROUND OF THE INVENTION

Field of the Invention

5   The present invention relates to a technique for managing environmental information and, more particularly, to a technique for managing environmental information about products.

Related Background Art

10   In general, a design system is used to manage, in designing of a product, product constitution information, drawings, parts specifications, etc. A procurement system is used to manage procurement results, i.e., information on parts and dealers, information on parts and raw materials, etc. Such design and procurement systems and environmental information about parts are not linked with each other, and it is difficult to obtain environmental information about a product. To obtain environmental information about a product, it is necessary to manually check information used in the design system, information used in the procurement system, and environmental information about parts and materials with each other. The process of manually checking such information is complicated and requires a great deal of labor.

On the other hand, makers, etc., are requested to consider environmental problems and to produce products

friendly to environmental, and there is a demand for a system which enables effective use of environmental information.

5   SUMMARY OF THE INVENTION

In view of the above-described circumstances, an object of the present invention is to provide a system and method for processing environmental information effectively and a recording medium on which a program

10   for processing environmental information is recorded.

To achieve this object, according to one aspect of the present invention, there is provided an environmental information system comprising a product constitution information storage section for storing

15   product constitution information including information on parts and/or raw materials constituting each of products, an environmental information storage section for storing environmental information about each product, the parts and/or the raw materials, and

20   integrated environmental information forming means for forming integrated environmental information with respect to each product on the basis of the product constitution information and the environmental information.

25   According to another aspect of the present invention, there is provided an environmental information system comprising a product constitution

information storage section for storing product constitution information including information on raw materials constituting each of products, a raw material environmental information storage section for storing

5   environmental information about the raw materials, and integrated environmental information forming means for forming integrated environmental information with respect to each product on the basis of the product constitution information and the environmental

10   information about the raw materials.

According to still another aspect of the present invention, there is provided an environmental information system for forming environmental data about products, the system comprising environmental data

15   forming means for forming environmental data about each product from design data, ordering data based on the design data, material data on the order-receiving side, hazardous chemical substance data originally input, and user information.

20   According to yet another aspect of the present invention, there is provided a method of processing environmental information, comprising the steps of storing product constitution information including information on parts and/or raw materials constituting

25   each of products, storing environmental information about each product, the parts and/or the raw materials, and forming integrated environmental information with

respect to each product on the basis of the product constitution information and the environmental information.

According to a further aspect of the present invention, there is provided a method of processing environmental information, comprising the steps of storing product constitution information including information on raw materials constituting each of products, storing environmental information about the raw materials, and forming integrated environmental information with respect to each product on the basis of the product constitution information and the environmental information.

According to still a further aspect of the present invention, there is provided a method of processing environmental information, comprising the steps of storing user information, searching environmental information about products according to the user information and on the basis of a data base in which the environmental information is stored, and displaying a result of a search through the environmental information obtained in the searching step.

According to still a further aspect of the present invention, there is provided an environmental information processing method in which environmental data about products are formed, the method comprising the steps of storing design data, ordering data based

on the design data, material data on the order-
receiving side, hazardous chemical substance data, and
user information, respectively and forming
environmental data about each product from the design

5 data, the ordering data, the material data, the
hazardous chemical substance data, and the user
information.

BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 is a diagram showing the configuration of
an environmental information system according to an
embodiment of the present invention;

Fig. 2 is a diagram showing the configuration of
the environmental information system connected to a

15 network;

Fig. 3 is a diagram showing the structure of a
data base;

Fig. 4 is a diagram showing the relationship
between tables in the data base;

20 Fig. 5 is a diagram showing the relationship
between parts and raw materials constituting a product;

Figs. 6A, 6B, 6C, 6D and 6E are diagrams showing
examples of tables;

Fig. 7 is a flowchart of processing in the product

25 environmental specification management system;

Fig. 8 is a diagram showing a login window;

Fig. 9 is a diagram showing a product environment

home page window;

Fig. 10 is a diagram showing a product environmental information search window;

Fig. 11 is a diagram showing a product environmental information search result list window;

Figs. 12A, 12B and 12C are diagrams showing tables for displaying the product environmental information search result list window;

Fig. 13 is a diagram showing a product environmental information reference/registration window;

Figs. 14A and 14B are diagrams showing tables for displaying the product environmental information reference/registration window;

Fig. 15 is a diagram showing a product raw material list window;

Figs. 16A, 16B, 16C, 16D and 16E are diagrams showing tables for displaying the product raw material list window;

Fig. 17 is a diagram showing a product/unit chemical substance list window;

Figs. 18A, 18B, 18C, 18D, 18E, 18F, 18G, 18H, 18I and 18J are diagrams showing tables for displaying the product/unit chemical substance list window;

Fig. 19 is a diagram showing a detailed product/unit chemical substance list window;

Fig. 20 is a diagram showing a case where

parts/raw material information is shared between a
plurality of corporations;

Fig. 21 is a diagram showing the network
configuration of a parts/material environmental

5   information sharing system in which parts/material
environmental information is shared between
corporations;

Fig. 22 is a diagram showing an example of a
client terminal display; and

10 Fig. 23 is a diagram showing details of flow of
parts/material environmental information between
corporations.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 Fig. 1 shows an example of the configuration of an
environmental information system according to an
embodiment of the present invention.

A parts/material/price scale information system
(procurement system) 24 prepares parts information, raw

20 material information and price scale information
(ordering data) on the basis of a data base 24a and
supplies these kinds of information to a procurement
information data warehouse 21 through an interface 23.
More specifically, the system 24 supplies information

25 shown in Figs. 6B to 6D, for example.

Fig. 6B shows electrical parts information
including items: "part ID", "size", "process step",

"dealer", "maker", "type",etc.   Fig. 6C shows worked

parts information including items: "part ID", "size",

"process step", "dealer", "maker", "material", "grade",

"color", "coloring", and "weight".   Fig. 6D shows

5   material information (material data) including items:

"kind of material", "maker", "material symbol",

"grade", "ID", "coloring", "type", etc.

Referring to Fig. 1, a green (environmental)

procurement on-line search system 25 supplies, for

10   example, environmental information about each part and

raw materials (hazardous chemical substance content

data), as shown in Fig. 6E, to the procurement

information data warehouse 21 through the interface 23.

Fig. 6E shows substance-contained-in-material

15   information as an example of environmental information.

Items of substance-contained-in-material information

shown in Fig. 6E are "kind of material", "maker",

"material symbol", "grade", "ID", "coloring", "type",

the existence/nonexistence of a "content of prohibited

20   substance"("Y": existence, "N": nonexistence), the

existence/nonexistence of a "content of substance to be

reduced" ("Y": existence, "N": nonexistence), the

existence/nonexistence of a "content of substance to be

controlled" ("Y": existence, "N": nonexistence, and a

25   "substance number" of such substances (a prohibited

substance, a substance to be reduced, a substance to be

controlled).   Apart from ordinary prohibited substances

or substances to be reduced, a substance to be
controlled is designated as a substance to be
prohibited or reduced under the control according to a
regulation specially established in a corporation or

5 the like which operates this system. These kinds of
environmental information (e.g., information on
hazardous substances) are used to enable use of parts
friendly to environmental and row materials and, hence,
designing and manufacture of products friendly to

10 environmental.

Prohibited substances and substances to be reduced
are determined on the basis of governmental regulations
or treaties between nations. A data base is prepared
in which data on substances controlled under laws is

15 recorded in accordance with respective governmental
regulations and treaties. Prohibited substances or the
like are prescribed based on this data base.
Prohibited substances or the like may be determined
according to strictest regulations. In this

20 embodiment, regulations according to a country for
which a product is destined and a treaty is selected.
Also, a country may be separately designated to make a
search for relating information.

Referring again to Fig. 1A, a hazardous substance

25 registration system 11 in a product environmental
specification management system 1 can register
hazardous substances (regulation data) in a product

hazardous chemical substance master data base 12. Data on hazardous substances in the data base 12 is supplied to the data warehouse 21 through an interface 22. This data on hazardous substances is also used as

5   environmental information.

The data warehouse 21 supplies the above-described information to an all-parts environmental data base 4 and to a material data base 5.

A parts configuration information system (design

10   system) 26 prepares product constitution information, information on parts specifications and the like (design data) as shown in Fig. 6A on the basis of a parts configuration information data base 26a, and supplies this information to a parts configuration

15   information data base 3 through an interface 2. Fig. 6A shows parts configuration information including items: "parent part ID", "parent part size", "parent part file division", "parent part process step", "child part ID", "child part size", "child part file

20   division", "child part process step", and "number" (the number of parts or the like used). The upper section of Fig. 6A shows the relationship between a parent part and child parts constituting the parent part, as expressed in a tree structure shown in the lower

25   section of Fig. 6A.

Referring to Fig. 1, a product information registration and updating system 10 can register and

update product information (including environment
information of a product) through a Web server 8.   A
product environmental specification application
(computer program) 6 is executed to form and register,
5   in a product environmental specification data base 7,
integrated product environmental information on the
basis of product information registered and updated by
the product information registration and updating
system 10, the parts configuration information data
10   base 3, the all-parts environmental data base 4, and
the material data base 5.   At the time of this
formation and registration, product environment keys
are assigned to products in one-to-one correspondence
with each other, thereby forming product information
15   including data on various parts and/or raw materials.

A user can refer to product environmental
information in the product environmental specification
data base 7 through the Web server 8 and the product
environmental specification 6 by using a product
20   environmental specification reference system 9.   For
example, if an instruction is provided to totalize the
amount of each of raw materials used, the total weights
of materials determined on the basis of the weights of
the materials used in parts and the numbers of parts
25   are displayed in descending order.   Also, if an
instruction is provided to totalize the amount of each
of hazardous chemical substances, the total contents of

the hazardous chemical substances determined on the
basis of the contents of the hazardous chemical
substance in raw materials and the weight of the raw
materials used are displayed in descending order.

5   Fig. 2 shows a network system in which the above-
described product environmental specification
management system 1 and systems 9 and 10 are connected
to a network 30. For example, the network 30 is an
intracorporate local area network (LAN). The product

10   environmental specification management system 1 has the
functions of a data base server, an application server
and a Web server, and uses, for example, Windows NT (a
product by Microsoft Corporation) as an operating
system. The systems 9 and 10 may be provided as one

15   computer having both the functions of the systems 9 and
10 or separate computers respectively having the
functions of the systems 9 and 10. The computer may
be, for example, a personal computer on which a Web
browser can operate.

20   Fig. 3 shows the internal configuration of the
product environmental specification data base 7, the
data bases 3, 4, and 5, and the external data bases 21
and 26a shown in Fig. 1. Fig. 4 shows the relationship
between tables in the product environmental

25   specification data base 7. The data bases 3, 4, and 5
are formed on the basis of the external data bases 21
and 26a and include a parts environmental information

master 41, a parts raw material master 42, a raw
material environmental information master 43, an in-
raw-material hazardous chemical substance master 44,
etc.

5   The parts environmental information master 41 has
part keys, management items, procurement items, and
parts environmental information items. The parts raw
material master 42 has parent part keys, raw materials
keys, and contents. The raw material environmental
10   information master 43 has raw material keys and
environmental information items. The in-raw-material
controlled component master 44 has raw material keys,
hazardous chemical substance keys, and content ratios.

The product environmental specification data base
15   7 has a product environmental information table 31, a
constitution table 32, a parts environmental
information table 33, a developed constitution table
34a, an inversely developed constitution table 34b, a
parts raw material table 35, a parts raw material
20   environmental information table 36, an in-raw-material
hazardous chemical substance table 37, product
hazardous chemical substance masters 38, and user
management masters 39c.

The product environmental information table 31 has
25   product environmental information keys (product ID
keys), management items (preparer, preparation/update
date, completion date, status), product environmental

information items, item correction information
(corrector, correction date).

The constitution table 32 has product
environmental information keys, parent part keys, part
5   keys, and numbers, and has information (constitution
information) on parts and/or materials constituting
each product in the product environmental information
table 31.

The parts environmental information table 33 has
10 product environmental information keys, part keys,
management items, procurement items, and part
environmental information items, and has environmental
information about parts corresponding to part keys
shown in the constitution table 32 (e.g.,
15 possibility/impossibility of reuse or the weight of
parts used).

Each of the developed constitution table 34a and
the inversely developed constitution table 34b has
product environmental information keys, an order (line
20 numbers), and part keys, and is temporarily used.

The parts raw material table 35 has product
environmental information keys, parent part keys, raw
material keys, and contents, and has information on raw
materials of parts corresponding to part keys in the
25 constitution table 32.

The raw material environmental information table
36 has product environmental information keys, raw

material keys, and environmental information items, and
has environmental information (e.g., the
existence/nonexistence of hazardous substances or
allowance/prohibition of recycling) about raw materials
5   corresponding to raw material keys in the part raw
material table 35.

The in-raw-material hazardous chemical substance
(controlled component) table 37 has product
environmental information keys, raw material keys,
10   hazardous chemical substance (controlled component)
keys, and content ratios, and has information on
chemical substances in raw materials corresponding to
raw material keys in the parts raw material table 35.

The product hazardous chemical substance masters
15   38 have hazardous chemical substance keys and CAS
numbers (ID numbers of chemical substances generally
used) and have information on chemical substances
corresponding to hazardous chemical substance keys in
the in-raw-material hazardous chemical substance table
20   37.

Data items on raw-materials and hazardous chemical
substances can be totalized with respect to each
product by searching the tables 31 to 37.

Fig. 5 illustrates the tables shown in Fig. 4 as a
25   part constitution diagram of a product relating to use
of. In Fig. 5, "EI" denotes environmental information.
The product EI (environmental information) is

constituted by parts A to D, for example. Part A is
constituted by child parts a1 to a3. Part B has child
parts b1 to b3 and has a raw material contained-in-
product O. Part C has raw material contained-in-

5   product O and P and has chemical substances V and W.
The raw material contained-in-product P has material EI
(environmental information). The part D has part EI
(environmental information) and has a chemical
substance X.

10   Fig. 7 is a flowchart showing a processing of the
product environmental specification application 6 using
the systems 9 and 10 shown in Fig. 1. The systems 9
and 10 perform processing by using a Web browser.

In step S1, logging-in processing is performed by

15   displaying a logging-in window shown in Fig. 8.
Referring to Fig. 8, a user can log in by inputting a
user ID 51 and a password 52 and clicking a login
button 53 with a mouse. Only predetermined users are
allowed to log in and unauthorized access to the system

20   by other persons is prevented. A password change
button 54 is used to change the password 52.

In step S2, menu processing is performed by
displaying a product information home page shown in
Fig. 9. Referring to Fig. 9, if the user clicks an

25   item 61 "Search for Product Environmental Information"
with the mouse, the process advances to step S3 and the
user can search for and refer to environmental

information already prepared with respect to each product. By clicking an item 62 "Search for parts Environmental Information" with the mouse, the user can search for and refer to environmental information about

5   parts or a product used from the parts and materials. By clicking an item 63 "Reference to Masters" with the mouse, the user can refer to the contents of various masters including product chemical substances. By clicking an item 64 "Comparison of Product Assessments"

10   with the mouse, the user can refer to and compare assessment targets with respect to products. Only an administrator can click an item 65 "Administer Menu" to newly prepare, finish or delete product environmental information. By clicking an item 66 "End", the user

15   terminates the session and logs out.

In step S3, search processing is performed by displaying a product environmental information search window shown in Fig. 10. If a return button 71 shown in Fig. 10 is clicked, the process returns to display

20   of the window shown in Fig. 9. If an item 70 "Explanation" is clicked, an explanation of a search method is displayed. The user may select a search key item 75 and input a corresponding search key word 76, or may select one of some alternatives at 77. Search

25   key items 75 are, for example, "Product Genre", "Order No.", "Product Name", etc. If a plurality of search condition items are provided, the AND (logical product)

of them is used.

A result display method may be selected by setting a display pattern 78, ordered items 79, and ascending or descending order 80. Ordered items 79 are, for example, an order number, and an environment correction number.

When a number check button 72 is thereafter clicked, the number of results corresponding to the above-described search conditions is displayed in a right bottom section in the window. It is possible to cancel the above-described search conditions by clicking a condition reset button 74. A click on a search result display button 73 leads the process to advance to step S4 , thereby search results displayed.

In step S4, a window shown in Fig. 11 is displayed which contains a list of the results of the product environmental information search. If a return button 86 shown in Fig. 11 is clicked, the process returns to display of the window shown in Fig. 10. If an item 84 "Explanation" is clicked, an explanation of a search result display method is displayed. In a search result list 85 are displayed order numbers, statuses, environment correction numbers, preparation information (preparers and preparation dates), product names, introduction dates, product genres, and product environmental information (e.g., average power consumption during operation, maximum power consumption

during operation), etc. If an item 82 "Next 15 Results" is clicked, the next 15 results are displayed in search result list 85. If an item 83 "Download All Results" is clicked, all the results become

5 downloadable. When one of product information buttons 81 is clicked, the process advances to step S5 and information on the corresponding product is displayed.

Display of the above-described search result list 85 is performed by using tables shown in Figs. 12A to

10 12C. Fig. 12A shows a user master table containing user IDs, passwords, product genre groups, and user names. Product genres are determined with respect to each user. Fig. 12B shows a list system parameter table according to product genre grouping shown in Fig.

15 12A. This table contains a product genre group and items ATTR (e.g., order No., file division, status). Fig. 12C shows a product environmental information table corresponding to the items ATTR shown in Fig. 12B. This table contains product environmental

20 information keys (order No., file division, correction No.), preparation/update dates, user names, statuses, and product environmental information items (average power consumption during operation, the amount of metal consumed, disassembly time, the amount of ozone

25 generated).

Data corresponding to display items extracted from the list system parameter table (Fig. 12B) is obtained

by searching the product environmental information table (Fig. 12C) to be displayed in the window shown in Fig. 11.

In step S5, a product environmental information reference/registration window shown in Fig. 13 is displayed. If a return button 90 shown in Fig. 13 is clicked, the process returns to display of the window shown in Fig. 11. If an item 96 "Explanation" is clicked, an explanation of this window is displayed. A click on an item 91 "List of Product Raw Materials" leads the process to advance to step S6, in which is displayed a list of the results of totalization of respective raw materials for different purposes, e.g., resin materials and pressed materials. A click on an item 92 "List of Product Chemical Substances" leads the process to advance to step S7, in which is displayed a list of chemical substances in the materials of products in a form classified in accordance with an intracorporate standard.

A click on an item 93 "Display of Constitution Information" triggers display of a list of parts configurations, in which items to be displayed can be selected from display patterns. A click on an item 94 "Search for Information on Items in Product Category" triggers a search for items in the ordered category. The results of this search are shown in a list according to a selected display pattern.

As product assessment information 95, each of "Common Information", "Energy Saving", "Space Saving", "Resource Saving", "Long Life", "Recoverability", "Decomposability", "Separability", "Recyclability",

5   "Environmental Friendliness", "Disposability (Reducing Hazardous Substances)", "Packaging", "Information Disclosure", and "Environmental Management" can be selected, referred to or registered. Data on one of these items referred to or registered is displayed in

10   an area 97. A click on a Download button 100 triggers downloading of information already registered. A click on an Add button 101 triggers addition of data in the area 97. A click on a Clear button 102 triggers clearing the area 97 of the information. A click on a

15   Register button 98 triggers registering as product assessment information the information displayed in the area 97. A click on a reset button 99 triggers resetting to the initial state.

Figs. 14A and 14B show tables for displaying the

20   window shown in Fig. 13. Fig. 14A shows an input system parameter table containing a genre group and items ATTR (order No., file division, environment correction No., preparation date, preparer user name, status), etc. Fig. 14B shows a product environmental

25   information table corresponding to the items ATTR shown in Fig. 14A. This table contains product environmental information keys (order number, file division,

environment correction No.), preparation dates,
preparer user names, statuses, product environmental
information items (average power consumption during
operation, the amount of metal consumed, disassembly
5   time, the amount of ozone generated).

Input items set in the input system parameter
table (Fig. 14A) according to genres for the login user
are extracted, as are those in the case of the product
environmental information search result list window
10   (Fig. 11). Data is obtained by searching the product
environmental information table (Fig. 14B) on the basis
of the input items extracted from the input system
parameter table (Fig. 14A) to be displayed in the
product environmental information
15   reference/registration window (Fig. 13).

In step S6, a product raw material list window
shown in Fig. 15 is displayed. If a return button 113
shown in Fig. 15 is clicked, the process returns to
display of the window shown in Fig. 13. If an item 114
20   "Explanation" is clicked, an explanation of this window
is displayed. When a kind of process step (e.g., one
indicated by "MO" (molded material), or one indicated
by "PX" (pressed material)) 111 is selected, and when
an Execute button 112 is clicked, a list 115 of product
25   raw materials corresponding to the selected process
step is displayed. The product raw material list 115
contains the kind of process step, part/material

division, maker codes, maker names, material symbols,
material names, thickness, the amounts of material
used, information about use of recycled resources,
recycled material contents, the existence/nonexistence

5   of a prohibited chemical substance ("Y" indicating the
existence, "N" indicating the nonexistence), the
existence/nonexistence of a prohibited chemical
substance ("Y" indicating the existence, "N" indicating
the nonexistence), the existence/nonexistence of a

10   chemical substance to be reduced ("Y" indicating the
existence, "N" indicating the nonexistence), the
existence/nonexistence of a chemical substance to be
controlled ("Y" indicating the existence, "N"
indicating the nonexistence), recyclability, material

15   display for recycling, identification of a Blue Angel
qualified copying machine, identification of a Blue
Angel qualified LBP (laser printer), identification of
a Blue Angel qualified BJP (bubble jet printer),
identification of a Blue Angel qualified BJCRG

20   (cartridge), information about green certificate,
comments, the green certification date. If an item 116
"Next 10 Results" is clicked, the next 10 results are
displayed in the list 115.

          If an item 117 "Download All Results" is clicked,

25   all the results become downloadable. When one of used
part buttons 116 related to the raw materials in the
list 115 is clicked, information on the corresponding

used part is displayed.

Figs. 16A to 16E show tables for displaying the window shown in Fig. 15. Fig. 16A shows a selection system parameter table containing the product genre

5 group and the menu ID (DSMENU_ID). Fig. 16B shows a menu parameter table corresponding to the menu ID shown in Fig. 16A. This table contains the product genre group, the menu ID, and data (molded material (resin material), pressed material (metallic material), paper

10 material, etc.) DATA. Fig. 16C shows a list system parameter table containing the product genre group, items ATTR (order No., file division, correction No., kind of process step). Fig. 16D shows a parts environmental information table corresponding the items

15 ATTR shown in Fig. 16C. This table contains product environmental information keys (order No., file division, correction No.), part keys (part No., size, file division, process step), dealers, part names, and parts environmental information (part weight, recycling

20 rate, use/non-use of a recycled part, green certification rank). Fig. 16E shows a part raw material table corresponding to the kind of process step shown in Fig. 16C. This table contains product environmental information keys (order No., file

25 division, correction No.), parent part keys (parent part No., parent part size, parent part file division, parent part process step), raw material keys (kind of

process step, maker code, material symbol, grade

number, coloring number), and contents.

With respect to the kind of raw material selected

in the menu and displayed, set raw material list items

5   are extracted on the basis of the parameters shown in

Figs. 16A to 16C, and corresponding data is obtained by

searching the part environmental information table

(Fig. 16D) and the part raw material table (Fig. 16E)

to be displayed in the window.

10   In step S7, a product/unit chemical substance list

window shown in Fig. 17 is displayed. If a return

button 121 shown in Fig. 17 is clicked, the process

returns to display of the window shown in Fig. 15. If

an item 122 "Explanation" is clicked, an explanation of

15   this window is displayed. In a product/unit chemical

substance list 127 are displayed control divisions

(e.g., prohibition and reduction), classification

numbers, classified names, and contents. A click on

one of used part buttons 128 related to the chemical

20   substance classes in the list 127 triggers display of

information on parts in which a chemical substance in

the chemical substance class is used.

If an item 125 "Next 10 Results" is clicked, the

next 10 results are displayed in the list 127. If an

25   item 126 "Download All Results" is clicked, all the

results become downloadable. A click on an item 123

"Product/Unit Chemical Substance List (Detailed)" leads

the process to advance to step S8, in which is displayed a window containing a detailed list of product/unit chemical substances, i.e., a detailed list of all chemical substances in a product. A click on an

5   item 124 "Chemical Substance Master Search" triggers a search in the chemical substance master data base.

Figs. 18A to 18J show tables for displaying the window shown in Fig. 17. Fig. 18A shows a list system parameter table containing the product genre group and

10   items ATTR (control division, classification No., classified name). Fig. 18B shows a constitution table containing product environmental information keys (order No., file division, correction No.), part keys (part ID, size, file division, process step), and

15   numbers. Fig. 18C shows a part raw material table corresponding to the part keys shown in Fig. 18B and containing product environmental information keys (order No., file division, correction No.), parent part keys (parent part ID, parent part size, parent part

20   file division, parent part process step), raw material keys (kind of process step, maker code, material symbol, grade number, coloring number), and weights. Fig. 18D shows an in-raw-material hazardous chemical substance table corresponding to the raw material keys

25   shown in Fig. 18C and containing product environmental information keys (order No., file division, correction No.), raw material keys (kind of process step, maker

code, material symbol, grade number, coloring number),

hazardous chemical substance keys (classification

number, substance number), and contents. Fig. 18E

shows a typical material master table section

5   corresponding to the classification number in the

hazardous chemical substance keys shown in Fig. 18D.

This table section contains the classification No., a

classified name, a control division, and a preparation

date. Fig. 18F shows a substance master table section

10   corresponding to the substance number in the hazardous

chemical substance keys shown in Fig. 18D. This table

section contains the substance number, a substance

name, a CAS number, a preparation date, etc. Fig. 18G

is a low-regulation master section. Fig. 18H is a

15   label master section. Fig. 18I is a chemical substance

regulating law master section. Fig. 18J is a chemical

substance regulating law master section.

The part raw material table (Fig. 18C) is searched

by using the parts keys contained in the constitution

20   table (Fig. 18B) to extract raw material keys. The in-

raw-material hazardous chemical substance table (Fig.

18D) is searched by using the raw material keys to

extract contained hazardous chemical substance

information. The typical substance master table (Fig.

25   18E) and the substance master table (Fig. 18F) are

searched from the contained hazardous chemical

substance information to display data corresponding to

the display items set as display parameters.

In step S8, a detailed product/unit chemical substance list window shown in Fig. 19 is displayed. If a return button 131 shown in Fig. 19 is clicked, the

5   process returns to display of the window shown in Fig. 17. If an item 132 "Explanation" is clicked, an explanation of this window is displayed. In a detailed product/unit chemical substance list 135 are displayed control divisions (e.g., prohibition and reduction),

10   classification numbers, classified names, substance numbers, substance names, CAS numbers, and contents. If an item 133 "Next 10 Results" is clicked, the next 10 results are displayed in the list 135. If an item 134 "Download All Results" is clicked, all the results

15   become downloadable.

A click on one of used part buttons 136 related to the chemical substances in the list 135 triggers display of information on parts using the corresponding chemical substance. A click on one of items 137

20   "Label" triggers display of environmental label information about the corresponding chemical substance. A click on one of items 138 "Law Regulation" triggers display of law regulation information about the corresponding chemical substance. To display this

25   window, the tables shown in Figs. 18A to 18J are also used.

Fig. 20 is a diagram showing a case where

parts/raw material information in the product

environmental specification management system shown in

Fig. 1 is shared between a plurality of corporations,

and where designers 210 to 213 in corporations A, B,

5   and C, and part/raw material makers D 214, and E 215

obtain part/raw material environmental information

through a data provision center 200.

In this case, (1) a procedure described below is

used. First, the designer (A)211 in corporation B

10   makes an inquiry about a maker (corporation E in this

case), a type and specification items. (2) The data

provision center 200 requests the parts/material maker

E 215 to make a reply about the type and specification

items. (3) The parts/material maker E 215 replies to

15   the data provision center 200 about the requested type

and specification items. The data provision center 200

sends the reply to the corporation B designer (A)211

who made the inquiry.

Fig. 21 is a diagram showing the network

20   configuration of a part/material environmental

information sharing system 140 for sharing

part/material environmental information between

corporations. The part/material environmental

information sharing system 140 is constituted by a part

25   environment data base 141 and a material environment

data base, used for data management, and a maker master

143, a client master 144 and a product hazardous

chemical substance master 145, used for master

management.   When a client 148 connected to Internet

146 by a server/TA 149 makes an inquiry (registration

investigation) about part/material information,

5   terminal data is collected according to the inquiry and

a reply (registration reply) from a part/material maker

147.

Fig. 22 is a diagram showing an example of display

of terminals at client 148.

10   Client 148 can refer to environmental information

about any part through a part information search window

150 and can also obtain information through electric

parts, mechanism material, packaging material, and

auxiliary material support 151 windows.   Client 148 can

15   also read information in a window for a new product

introduction reference 152 to parts/materials

registered by a parts/material maker without

registration investigation by the client, and

information in a window for an enterprise environmental

20   tendency information reference 153 about parts/material

makers.

Fig. 23 shows details of the above-described

information flow.

First, client 148 obtains information by making

25   investigation 154 into part/material environmental

information existing in the part/material environmental

information sharing system 140.   In the case of absence

of the desired information, a data provision center 139

sends an environmental investigation request 155 to

part/material maker 147. Part/material maker 147 makes

part/material environmental information investigation.

5   Client 148 is then informed of new part/material

investigation results 157.

Units/products and unit/products makers, as an

alternative to parts/materials and parts/material

makers, may also be used. In such a case, a

10   unit/product environmental information sharing system

is formed in place of part/material environmental

information sharing system to enable consumers,

corporations and government agencies to search and

refer to information in a crossover manner.

15   In this embodiment, as described above, a design

system, a procurement system and environmental

information data base are linked to enable acquisition

of product information on the basis of information on

parts and raw materials constituting a product. The

20   information system of the present invention also

enables environmentally friendly designing and

manufacturing using parts/raw material environmental

information and product environmental information while

considering environmental problems. Further, the

25   information system can be used for product

environmental information investigation at the time of

green purchase by a consumers, a corporation or a

government agency.

The information system of the present invention also makes it possible to grasp raw materials used in a product and hazardous substances contained in the

5   materials and is, therefore, advantageously effective in determining a product recycling method and in preventing environmental pollution upon the waste disposal. In designing a product, reference to parts/raw material information and product information,

10   including environmental information, in accordance with the present invention contributes to the improvement in the reliability of the product. It also contributes to the reduction in the number of kinds of raw materials used in the product, thereby improving the facility

15   with which the materials of the product are separated. Therefore the information system of the present invention is effective in promoting recycling and in reducing the amount of hazardous chemical substance waste.

20   Referring back to Fig. 1, the parts or raw materials constituting a product in the parts constitution information system 26 may be changed as a result of a design change. It is desirable to reconstruct the product environmental specification

25   data base 7 each time the constitution information supplied from the parts constitution information system 26 to the product environmental specification

management system 1 is changed. However, if the

product environmental specification data base 7 is

frequently reconstructed, the load on the product

environmental specification management system 1 becomes

5   so large that users cannot refer to the data base 7.

Therefore the data base 7 may be reconstructed only

when the constitution information is substantially

changed. For example, the data base 7 may be changed

when a raw material constituting a product is changed

10   or when the number of parts or raw materials

constituting a product is changed.

When the data base 7 is reconstructed, it is

desirable that the contents of the data base 7 in the

past should be maintained. For example, when a product

15   is supplied to the market, a plurality of corresponding

models varying in design exist mixedly on the market.

In such a case, the contents of the data base 7 can be

referred to obtain information on each of the plurality

of models if the information on the previous models is

20   maintained.

The information system of the present invention

can cope with regulations under laws in various

countries.

The present invention also comprises supplying a

25   program code for software for realizing the functions

of the above-described embodiment and performing the

functions by processing in accordance with a program

stored in a system computer (CPU or MPU).

In such a case, the software program code itself realizes the functions of the above-described embodiment, and the program code itself and means for

5 supplying the program code to the computer, e.g., a recording medium on which the program code is stored, constitute the present invention. Examples of the recording medium for storing such a program code are a floppy disk, a hard disk, an optical disk, a magneto-

10 optical disk, a compact disc-read only memory (CD-ROM), a magnetic tape, a nonvolatile memory card, and a read only memory (ROM).

The above-described embodiment of the present invention illustrates only an example of implementation

15 of the invention and is not construed as limiting the technical scope of the invention. That is, the present invention can be implemented in other various forms without departing from its technical spirit or from its essential features.

20 According to the present invention, as described above, environmental information about parts or raw materials used in a product can be controlled, which is remarkably effective in preventing environmental pollution when the product is disposed of. Reference

25 to this information in designing the product contributes to the improvement in reliability of the product and also contributes to the reduction in the

number of raw materials used in the product to facilitate separation of the product materials. The present invention is therefore effective in promoting recycling and reducing the amount of hazardous chemical

5   waste.